Case Report Rapport de cas

Exophthalmos due to multicentric B-cell lymphoma in a goat

Beth A. Valentine, Susanne Stieger-Vanegas, Steven R. Brown, Susan J. Tornquist, Kyra Young

Abstract — Multicentric B-cell lymphoma with extensive retrobulbar involvement was diagnosed in a 6-year-old Nubian goat that was presented with conjunctival swelling and exophthalmos. Serologic testing for bovine leukemia virus (BLV) was negative. Postmortem computed tomography aided in identification of the extent of soft tissue and bone lesions.

Résumé — Exophtalmie causée par un lymphome B multicentrique chez une chèvre. Un lymphome B multicentrique avec une vaste atteinte rétrobulbaire a été diagnostiqué chez une chèvre nubienne âgée de 6 ans qui avait été présentée avec de l'enflure conjonctivale et l'exophtalmie. Des tests sérologiques pour le virus de la leucémie bovine se sont avérés négatifs. Une tomodensitométrie réalisée à l'autopsie a facilité l'identification de l'étendue des lésions dans les tissus mous et les os.

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Lymphoma is a sporadic disease in goats and clinical signs are extremely variable (1–8). Exophthalmos accompanied by peripheral lymphadenomegaly is a common presentation in cattle with multicentric bovine leukemia virus (BLV)-induced lymphoma (9,10). A similar syndrome has been reported in 2 goats with lymphoma (4,7), but conjunctival swelling and exophthalmos as the primary presenting signs without peripheral lymphadenomegaly or signs of systemic disease has not been previously reported in goats. The cell type of caprine lymphoma is poorly studied, and only 1 case report of caprine lymphoma describes immunophenotyping, which resulted in a diagnosis of T-cell lymphoma (8). This report describes clinical, computed tomographic, and pathologic studies including immunophenotyping of multicentric lymphoma causing conjunctival swelling and exophthalmos in a goat.

Case description

A 6-year-old 70-kg castrated male Nubian goat was evaluated for bilateral conjunctival swelling. A full cranial nerve examination was not performed, but conjugate eye movements were present and no visual, motor, or sensory deficits were apparent. There were no other physical abnormalities and appetite and activity level were described as normal. A hypersensitivity reaction was suspected but there was only temporary improvement following subconjunctival injection of corticosteroids. Progressive conjunctival swelling and bilateral exophthalmos, more severe on the left, developed in the next 1.5 mo, and an ulcer developed in the left cornea (Figure 1). No intraocular abnormalities were detected. Differential diagnoses at this time were retrobulbar abscess or neoplasia. Peripheral lymph nodes and mandible were palpated and abnormalities were not detected. Sinus percussion was not performed.

Figure 1. Photograph of a 6-year-old castrated male Nubian goat with bilateral exophthalmos, more severe on the left side. Fluorescein dye retention within the left cornea indicates ulceration due to exposure keratitis.

Cytologic examination of a conjunctival scraping revealed inflammation. A biopsy sample of left ventral conjunctiva contained a dense cellular infiltrate of small, relatively uniform, round cells with approximately 3 mitoses per high power field. No germinal centers typical of lymphoid hyperplasia were seen.

Veterinary Diagnostic Laboratory and Department of Biomedical Sciences (Valentine, Tornquist) and the Department of Clinical Sciences (Stieger-Vanegas), College of Veterinary Medicine, Oregon State University, Corvallis, Oregon, USA; Animal Medical Care of Newport, 162 NE 10th Street, Newport, Oregon, USA (Brown, Young).

Address all correspondence to Dr. Valentine; e-mail: Beth.Valentine@oregonstate.edu

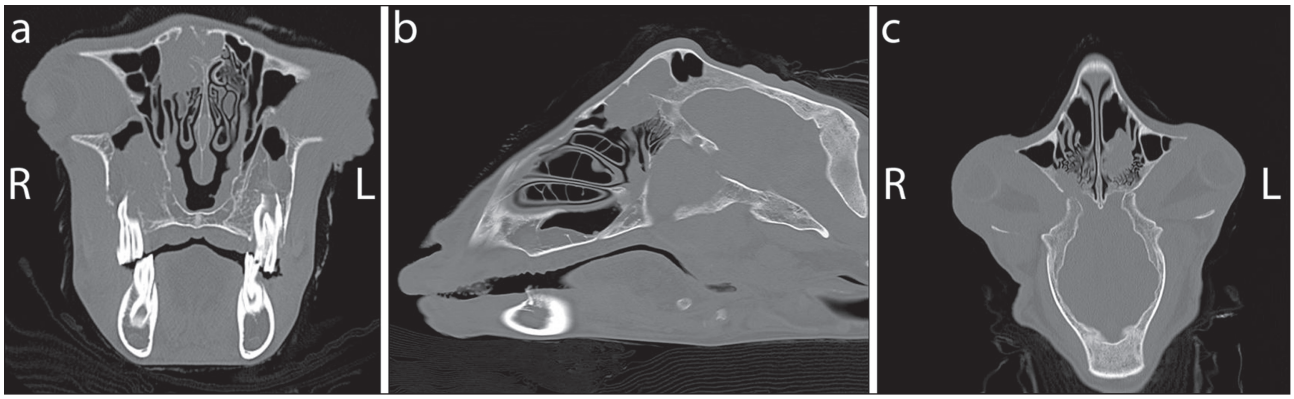

Figure 2. Postmortem transverse (a), sagittal (b), and dorsal (c) computed tomography bone window images of the head. A soft tissue mass is present invading the ethmoid bone and dorsal aspect of the right nasal cavity and right frontal sinus. Another soft tissue mass is present in the right maxillary sinus causing loss of the bony structures around the second, right maxillary premolar.

The differential diagnoses were atypical reactive lymphoid hyperplasia and lymphoma. Immunohistochemistry, utilizing antibodies to CD3 and CD79α (Dako, Carpinteria, California, USA), appropriately identified B- and T-lymphocyte populations within a normal goat lymph node (positive control). Cells in the conjunctival biopsy tissue reacted positively with CD79α. There were only a small number of scattered CD3-positive T cells. The diagnosis was B-cell lymphoma.

A retrobulbar lymphoma extending into the conjunctiva and causing exophthalmos was suspected. Ultrasonographic studies of the eyes were planned but the goat died 2 wk later, before antemortem imaging studies could be performed. Postmortem computed tomography of the head, thorax, and abdomen was performed using a 64-slice computed tomography scanner (Toshiba America, Tustin, California, USA) with slices acquired at 2 mm. Axial images and coronal and sagittal reconstructed images were evaluated in a soft tissue, bone and lung window. Multiple lesions were present in the head (Figure 2), thorax, and abdomen. An approximately 3.0 × 1.7 × 2.9 cm large soft tissue mass was present in the right frontal sinus adjacent to the ethmoid bone. The mass extended caudally into the rostral aspect of the right olfactory bulb, cranially into the right caudal maxillary sinus displacing the dorsal conchae of the right nasal cavity, and disrupted the overlying frontal bone. A smaller, inhomogeneous, hyperdense soft tissue mass was present in the ventral left frontal sinus, extending through the ethmoid into the rostral left olfactory bulb. A soft tissue mass was present in the medial aspect of the right and left retrobulbar spaces. Soft tissue masses were more prominent on the left side than the right and caused lateral displacement and compression of the left eye. An inhomogeneous soft tissue mass was present in the right caudo-lateral maxillary sinus that extended caudally to the last molar, disrupted the maxillary bone, and involved the tooth root of the second right maxillary premolar. Another large soft tissue mass was present adjacent to the caudo-lateral border of the right mandible and extended into the right parotid salivary gland.

Mandibular, retropharyngeal, and cervical lymph nodes were enlarged. Findings in the body were severe pleural effusion, marked enlargement of all lymph nodes of the thoracic cavity, marked thickening of the right atrial wall, multiple variably sized soft tissue masses within lung parenchyma, a large subcutaneous soft tissue mass within the right thoracic wall and invading the right abdominal cavity, irregular thickening of the abomasum wall, and peritoneal effusion. Computed tomography findings were consistent with multicentric lymphoma.

Necropsy findings mirrored those of computed tomography. Thoracic and abdominal effusions were serosanguinous. No tumor cells were found in the thoracic fluid examined cytologically. Infiltrating neoplastic tissue was soft, pale tan, and fleshy. Histologic evaluation confirmed the diagnosis of multicentric lymphoma, with tumor cell morphology and mitotic activity as seen in the conjunctival biopsy. Serologic testing of thoracic fluid and heart blood was negative for bovine leukemia virus (BLV).

Discussion

A prior survey study found that lymphoma represented 2.2% of all goat submissions and approximately 50% of all neoplasia in goats (2). Multicentric lymphoma is the most common form of caprine lymphoma (2–4,6–7). Age of affected goats has ranged from 2 to 18 y, and no gender or breed predisposition has been detected (2). Loss of body condition is described in 11 of 19 reported goats with lymphoma; in others, body condition is described as normal to increased (1–8). Generalized peripheral lymphadenomegaly is not consistent, and was detected in only 8 of 19 reported cases (1–8). It has been suggested that lymphoma should be considered as a differential diagnosis in any goat over 2 y of age with any clinical disease (2). Findings in the goat in this report, in which the clinical signs of multicentric lymphoma were progressive chemosis and exophthalmos, support this suggestion.

Involvement of structures of the head, especially maxilla, mandible, and mandibular lymph nodes, is common in goats with lymphoma, and was described in 11 of 19 cases (1–8). Results of this study support that conclusion and indicate that lymphoma should be considered in goats with conjunctival swelling or exophthalmos as well as with mandibular or maxillary bone swelling (1–3,5). Commercial antibodies can determine tumor cell type by immunohistochemistry. The diagnosis

of B-cell lymphoma in this case and of T-cell lymphoma in a previous case (8) indicates that lymphoma in goats can be of variable cell origin. Imaging procedures such as ocular ultrasonography can detect retrobulbar neoplasia in farm animals with exophthalmos (11). In this case, computed tomography proved to be a valuable imaging technique for identification of tumor infiltrates in both soft tissue and bone. CVJ

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